

REMARKS

Claims 1-21 were originally presented in this application. Claims 1-21 have been rejected under 35 U.S.C. 112, 2d paragraph, as indefinite. Claims 1-3 and 21 have been rejected under 35 U.S.C. 102(b) as anticipated by Bevans; claims 1, 2, 8-10, and 21 have been rejected under 35 U.S.C. 102(b) as anticipated by Fujii; claims 1-4 and 21 have been rejected under 35 U.S.C. 102(b) as anticipated by Saeki; and claims 11-14 have been rejected under 35 U.S.C. 103(a) as obvious over Fujii.

Applicant has amended paragraph 0018 to add a missing word for better readability, paragraph 0027 to correct an error pointed out by the Examiner, and paragraphs 0022, 0023, 0026, 0029, 0031 to make the specification congruent to the claims where needed. Applicant declines to make changes with respect to the terminology in claims 7, 9, 11, because they are supported by paragraphs 0016, 0010, 0031, and 0010, respectively.

The Anticipation Rejection of claims 1-3 and 21 on Bevans

This ground of rejection is respectfully traversed. Applicant's turbine wheel rotates in the direction of R (counterclockwise), so that the smaller radii of curvature face 3 is the front face and larger radii of curvature face 4 is the back face. This wheel is driven so that it throws off paint, for example, by centrifugal force.

Bevans rotates clockwise (w/reference to Fig. 1) so that it does not throw a fluid, but is driven by means of a fluid (water) jet k. In addition to functioning in an opposite manner (being driven instead of driving) and for a different purpose, the fans (blades) have exactly parallel radii of curvature of both the front face and the back face. Applicant's turbine, on the other hand, has blades which have different radii of curvature on the front face than on the back face.

In Bevens, the fluid engages the concave side of the blades. In Applicant's invention, fluid is driven by the convex side of the blades.

Thus claim 1 defines over Bevens for several structurally defined reasons. Claims 2, 3, and 21 depend from claim 1 and define over Bevens for at least the same reasons as does claim 1.

The Anticipation Rejection of claims 1, 2, 8-10, and 21 on Fujii

The difference between claim 1 and Fujii are very similar to the differences of claim 1 from Bevens. In Fujii, "the blade gains thinckness by degrees from the outer edge inwards" (column 2, lines 21 and 22). That is just the opposite of Applicant's invention, as defined by claim 1. With reference to claim 1, it is clear that the structure defined, "at least portions of the front face have a lesser radius of curvature than the back face, and the radially outer portions of the front face and of the back face have a lesser radius of curvature than the radially more inward portions," differs markedly from Fujii. Further, claim 1, as revised, states that the front face (3) is convex and the back face (4) is concave. Fujii clearly defines the front face 14 as concave and the back face 17 as convex.

The larger end 12 of Fujii is the inner end and the smaller end 13 is the outer end of the blade (column 2, lines 16-20).

Applicant's invention, as defined by claim 1, is not just different, but it is carefully dimensioned to achieve its stated purpose. It is shaped differently than Fujii, it is oriented differently than Fujii, and functions in a manner completely unrelated to the manner in which Fujii functions. In Fujii, the relationship between adjacent blades is an integral aspect of its function. See the paragraphs from column 2, line 72, to column 3, line 34 (Figs. 6 and 7). The shape of the Fujii

blade is chosen so that the desired result is accomplished by every two adjacent blades functioning together.

Applicant's blades, on the other hand, each perform the desired function. The only question is how many blades, 24, 30, or 36, for example, are required for the purpose at hand.

Claims 2, 8-10, and 21 depend from claim 1 and define the invention over Fujii at least for the same reasons.

The Anticipation Rejection of claims 1-4 and 21 on Saeki (Fig. 8)

Saeki suffers from the same deficiencies with respect to claim 1 as do Bevans and Fujii. The "concave front (or leading) 4 and convex rear (or trailing) 5 surfaces" define the essence of Saeki's blades (column 5, lines 39-50). Like Fujii, the combined function of adjacent blades is what makes the Saeki fan work as intended (column 2, lines 54-64).

With respect, to Fig. 8, "each curved blade 2 comprises a radially outside part 24 having a larger radius of curvature ... and a radially inside part 25 having a smaller radius of curvature." (column 8, lines 21-24). Once again, this is the opposite of Applicant's blade structure and function. Claim 1, as amended, calls for "a convex front face" and "a concave back face," and Saeki's blades are the opposite. Further, as reiterated from claim 1 "at least portions of the front face have a lesser radius of curvature than the back face, and the radially outer portions of the front face and of the back face have a lesser radius of curvature than the radially more inward portions." This defines clearly over Saeki because on the other hand, the inward end 25 of Saeki is of smaller radius of curvature and outer end 24 has a larger radius of curvature. Again, this is just the opposite of Applicant's invention, as defined by claim 1.

The possible argument that the wheel can be simply rotated in the opposite direction or something else reversed would be structurally and technically wrong, illogical, and unsupportable. The blades, and their relationships to each other (in the reference) and their respective purposes, have been very carefully crafted and are mathematically precise. The blade of the prior art cannot perform the function of Applicant's blade. It doesn't even approach a similar purpose in a similar way.

The Obviousness Rejection of claims 11-14 on Fujii

Claims 11-13 depend from claim 1 which has already been distinguished from Fujii in several particulars. These claims are believed to be patentable at least for the same reasons.

Independent claim 14 has all the same limitations that distinguishes claim 1 from Fujii, plus the requirement "that the outer edge of the turbine blade is ahead of the inner edge in the direction of rotation, the connecting line being inclined by 2° to 15° relative to the radius Vector directed toward the inner edge of the turbine blade."

While Fujii does not appear to ever state the direction of rotation of the fan, it seems clear that the direction would be counterclockwise with respect to Fig. 5. That means the outer end of the blade leads in the direction of rotation, giving some element of similarity with Applicant's claimed invention. The Examiner states that this angle of inclination of the blade is "about 30 degrees." But the Examiner then goes on to say that Applicant's requirement of 2° to 15° inclination is "a matter of design choice." This statement is without foundation, technically wrong, and is completely unsupportable.

Turbine blades, like optical elements, are very carefully designed to achieve very specific results. Their shapes, relative curvatures, thicknesses, angles, and lengths, all in relation to the direction of rotation, are never “a matter of design choice.”

What Applicant has pointed out here is that:

- His turbine blade gets thicker from the inner end toward the outer end - - all the cited prior art does the opposite, or does not taper (Bevans).
- His leading face in contact with the operative fluid, is convex - - all the cited art has a concave face in contact with the operative fluid.

The references cited but not applied have been reviewed. Applicant found no reason to discuss any of them in relation to the claims in this application.

The Indefiniteness Rejection

In an effort to advance prosecution, Applicant has revised several claims to obviate the rejection on this ground.

Specification – antecedent basis

The specification has been amended where necessary to provide a clear antecedent basis for the claim language, based on the total disclosure of the specification, claims, and drawing. No new matter has been added.

New Power of Attorney

A new Power of Attorney is enclosed, duly executed by an officer of the assignee company.

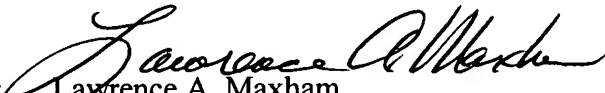
CONCLUSION

In view of the above discussion, and the claim amendments, Applicant believes this application is in condition for allowance and reconsideration is requested. Should any issues remain unresolved, the Examiner is invited to telephone the undersigned attorney.

The Commissioner is hereby authorized to charge any fees that arise in connection with this filing which are not covered by the money enclosed, or credit any overpayment, to Deposit Account No. 02-0460.

Respectfully submitted,

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